

5 manipulating the visual image to reposition individual teeth in the visual image;
6 [and]
7 producing a final digital data set representing the final tooth arrangement with
8 repositioned teeth as observed in the image; and
9 producing a plurality of intermediate digital data sets representing a series of
10 successive tooth arrangements progressing from the initial tooth arrangement to the final tooth
11 arrangement.

1 20. (As filed) A method as in claim 19, wherein the step of providing a digital data set
2 representing an initial tooth arrangement comprises scanning a three-dimensional model of a patient's teeth.

1 21. (As filed) A method as in claim 20, wherein the manipulating step comprises:
2 defining boundaries about at least some of the individual teeth; and
3 moving at least some of the tooth boundaries relative to the other teeth in an image based on the
4 digital data set.

1 ~~22. (Amended) A method for producing a plurality of digital data sets~~
2 ~~representing a series of discrete tooth arrangements progressing from an initial to a final~~
3 ~~arrangement, said method comprising:~~
4 ~~providing a computer system;~~
5 ~~providing to the computer system a digital data set representing an initial tooth~~
6 ~~arrangement;~~
7 ~~providing to the computer system a digital data set representing a final tooth~~
8 ~~arrangement;~~
9 ~~producing using the computer system a plurality of successive digital data sets~~
10 ~~based on the previously provided digital data sets, wherein said plurality of successive digital~~
11 ~~data sets represents a series of successive tooth arrangements progressing from the initial tooth~~
12 ~~arrangement to the final tooth arrangement.~~

1 23. (As filed) A method as in claim 22, wherein the step of providing a digital data set
2 representing an initial tooth arrangement comprises scanning a three-dimensional model of a patient's teeth.

24. (Amended) A method as in claim 22, wherein the step of providing a digital data set representing a final tooth arrangement comprises:
defining boundaries about at least some of the individual teeth on a visual image provided by the computer system; and
moving at least some of the tooth boundaries relative to the other teeth in the visual [an] image based [on the digital data set] to produce the final data set.

25. (As filed) A method as in claim 22, wherein the step of producing a plurality of successive digital data sets comprises determining positional differences between the initial data set and the final data set and interpolating said differences.

26. (As filed) A method as in claim 25, wherein the interpolating step comprises linear interpolation.

27. (As filed) A method as in claim 25, wherein the interpolating step comprises non-linear interpolation.

28. (As filed) A method as in claim 25, further comprising defining one or more key frames between the initial tooth arrangement and final tooth arrangement and interpolating between the key frames.

29. (Amended) A method for fabricating a plurality of dental incremental position adjustment appliances, said method comprising:
providing a digital data set representing an initial tooth arrangement;
providing a digital data set representing a final tooth arrangement;
producing a plurality of successive digital data sets based on the previously provided digital data sets, wherein said plurality of digital data sets represent a series of successive tooth arrangements progressing from the initial tooth arrangement to the final tooth arrangement; and
fabricating appliances based on at least some of the produced digital data sets.

30. (As filed) A method as in claim 29, wherein the step of providing a digital data set representing an initial tooth arrangement comprises scanning a three-dimensional model of a patient's teeth.

1 31. (As filed) A method as in claim 29, wherein the step of providing a digital data set
2 representing a final tooth arrangement comprises:
3 defining boundaries about at least some of the individual teeth; and
4 moving at least some of the tooth boundaries relative to the other teeth in an image based on the
5 digital data set to produce the final data set.

1 32. (As filed) A method as in claim 29, wherein the step of producing a plurality of
2 successive digital data sets comprises determining positional differences between the initial data set and the final
3 data set and interpolating said differences.

1 33. (As filed) A method as in claim 32, wherein the interpolating step comprises linear
2 interpolation.

1 34. (As filed) A method as in claim 32, wherein the interpolating step comprises non-
2 linear interpolation.

1 35. (As filed) A method as in claim 32, further comprising defining one or more key
2 frames between the initial tooth arrangement and final tooth arrangement and interpolating between the key
3 frames.

1 36. (As filed) A method as in claim 29, wherein the fabricating step comprises:
2 controlling a fabrication machine based on the successive digital data sets to produce successive
3 positive models of the successive tooth arrangements; and
4 producing the dental appliance as a negative of the positive model.

1 37. (As filed) A method as in claim 36, wherein the controlling step comprises:
2 providing a volume of non-hardened polymeric resin; and
3 scanning a laser to selectively harden the resin in a shape based on the digital data set to produce
4 the positive model.

1 38. (As filed) A method as in claim 36, wherein the producing step comprises modeling
2 the appliance over the positive model.

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1 39. (As filed) A method for fabricating a dental appliance, said method comprising:
2 providing a digital data set representing a modified tooth arrangement for a patient;
3 controlling a fabrication machine based on the digital data set to produce a positive model of the
4 modified tooth arrangement; and
5 producing the dental appliance as a negative of the positive model.

1 40. (As filed) A method as in claim 39, wherein the controlling step comprises:
2 providing a volume of non-hardened polymeric resin;
3 scanning a laser to selectively harden the resin in a shape based on the digital data set to produce
4 the positive model.

1 41. (As filed) A method as in claim 39, wherein the producing step comprises molding the
2 appliance over the positive model.

1 42. (As filed) A method for fabricating a dental appliance, said method comprising:
2 providing a first digital data set representing a modified tooth arrangement for a patient;
3 producing a second digital data set from the first data set, wherein the second data set represents
4 a negative model of the modified tooth arrangement; and
5 controlling a fabrication machine based on the second digital data set to produce the dental
6 appliance.

1 43. (As filed) A method as in claim 42, wherein the controlling step comprises selectively
2 hardening a non-hardened resin to produce the appliance and separating the appliance from the remaining liquid
3 resin.

1 44. (As filed) A method as in claim 42, wherein the appliance comprises a polymeric shell
2 having a cavity shaped to receive and resiliently reposition teeth from an initial tooth arrangement to the modified
3 tooth arrangement

REMARKS

Initially, Applicants wish to thank the Examiner for the courteous and helpful interview held on July 19, 2000.

Claims 19-44 are pending. Applicants gratefully acknowledge the indicated allowability of claims 36-44, once the obviousness-type double patenting rejection is overcome. The remaining claims were variously rejected over 35 USC §§101, 102, and 103.

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